DOCUMENT RESUME

ED 093 474 PS 007 265

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TITLE	Some Exploratory Studies of the Art of Preschool Children. Informal Paper.
INSTITUTION	Cornell Univ., Ithaca, N.Y. Cornell Research Program in Early Childhood Education.
SPONS AGENCY	National Center for Educational Research and Development (DHEW/OE), Washington, D.C. Div. of Educational Labs.
PUB DATE	Apr 70
CONTRACT	OEC-3-7-070706-3118
NOTE	24p.; Paper presented at the Symposium on "Creativity and the Preschool Child" (Syracuse University, New York, August 1968)
EDRS PRICE	MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS	*Age Differences; *Art Expression; *Behavioral Science Research; *Child Development; Cognitive Processes; Observation; *Preschool Children; Teacher Role

ABSTRACT

This report describes a series of studies concerned with preschool children's art. Preliminary work was based on observation of sessions in which one child would draw a picture in the presence of an adult. Major findings were that: (1) the children did not have preconceived notions of what they would draw; (2) they did not try to capture a moment in time, but rather drew "diagrams" of changes over time; (3) much scribbling was the result of manipulative rather than representative movements; and (4) when describing their work, the children used the adult as a passive listener rather than an active instructor. Preschooler's work in drawing and clay was compared to assess whether the three dimensional medium would reduce distortion. Also, subjects' representations of objects were collected and analyzed, indicating that the children may have been representing experiences with objects rather than the object itself. The final group of studies investigated the performance of many children on one activity (drawing a square). It appears that 4-year-olds were significantly more advanced at this task than 3-year-olds. Subjects between 42 and 49 months received various levels of training in square drawing, but these procedures were generally ineffective. Results are discussed in terms of developmental processes that could be involved. (DP)

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Document Number 70706-WC(8)
Printed April, 1970

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Some Exploratory Studies of the Art of Preschool Children

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Informal Paper

The research or work reported herein was performed pursuant to a contract with the Office of Education, U. S. Department of Health, Education, and Welfare through the Cornell Research Program in Early Childhood Education, a component of the National Laboratory on Early Childhood Education, contract OEC-3-7-070706-3118.

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SOME EXPLORATORY STUDIES OF THE ART OF PRESCHOOL CHILDREN[1]

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Dr. W. Lambert Brittain, Cornell University

Very little work has been done on understanding the art work of preschool children. This is rather surprising when one realizes that any nursery school program devotes a great deal of time to the use of art with children. Probably one reason for this lack of attention to the pre-representational work of children is that the markings that young children make are often regarded as lacking any meaning. In fact, the word "scribbling" has negative connotations, and it must be admitted that nursery school teachers are somewhat hardpressed when asked to discuss what appears to be the random markings of their nursery school children.

During the past couple of years I have been trying to make some sense out of the artwork of preschool children. Cornell has graciously provided a nursery school filled with children for me to work with, and funds have been made available through the National Laboratory on Early Childhood Education for some graduate assistants.

A good deal of my time during the first year of our study was spent in observing nursery school children while they were drawing and painting.

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[1]Speech given at the Symposium on "Creativity and the Preschool Child," Syracuse University, August 14, 1968.

We wasted a considerable amount of tape trying to record children's comments by putting a microphone on the nursery school easel. Our thought was that we could easily compare the finished drawing or painting with the comments that the child made during the act of painting. However, there seemed to be very little conversation going on except when an adult stopped by, and this was limited to a "Oh, isn't that nice," type of comment with often no or little reply from the child. Our experimentation obviously had to become much more sophisticated.

The next step was to have a friendly graduate assistant go into the nursery school with some rather attractive drawing tools. These included an array of colored felt pens which we made sure were not available elsewhere in the nursery school. The children were invited to sit down and draw, and the tape recorder this time kept track of the questions and answers in a setting that was a little more controllable. Obviously, some children were more verbal than others, and we took advantage of those children who verbalized readily. We concentrated our work on a group of four-year-old children. This time we could come up with many hypotheses and in some cases could draw inferences from the comments of the children and the finished products.

Some rather interesting conclusions were drawn from this individual approach to working with children. It became obvious that a young child when he begins a painting or a drawing does not have a preconceived

notion as to what the end product itself will look like. Now, adults and older children, on the other hand, will often know and tell you what the picture is going to be about before the process begins. However, these nursery school children would start drawing and talking about their drawings and in the process itself the drawings would change. That is, the line that was originally called "water" would turn into a "tree" which, by the time the picture was completed, would somehow or other be called a "pirate." So, the child was not only affected by the picture itself as it progressed, but he also changed his own concept of what he was drawing as the visual image was being put down. The completed drawing, therefore, turned out to be more a record of the thinking process than a concrete representation of a particular thought or image.

Another rather interesting point is that the scribbles and lines which can often be looked upon as meaningless to adults did in fact have real meaning to the child who is doing these drawings. A child would not be drawing an object but rather would be drawing non-visual representations. That is, the wavy line is not so much a representation of the surface of the water as it is the motion or movement of a boat going through the water. The paper often becomes a map upon which the child draws the path of an object but rarely the object itself. Roughness, smoothness, or hurry-up lines apparently are just as important as any visual impression of an object.

Some of the more verbal children carried on a dialogue while in the drawing process. A child's story would change constantly throughout the drawing process, and there seemed to be no compulsion to adhere to any particular scene. He can add or rearrange things in his picture which correspond with the story at any point, or pick a new thread from the picture itself so that the finished drawing may look very little like it did at the beginning, and the condition or completeness of the drawing itself seems to have little relationship to when it is pronounced finished.

Children had difficulty in recognizing their own paintings the day after they were completed. As is usual procedure in a nursery school, paintings were put aside to dry and then labeled so that the children could take these home later for the admiration of parents. One boy refused to acknowledge that one of the pictures was his until he suddenly remembered that he had mixed up a grey by combining several colors on the easel tray. Apparently a mixing of colors was the clue rather than the visual image of the painting itself. That these children could not identify their own pictures may mean that the completed image was not clear to them or that they could not retain this image. This does not mean that these children did not want their paintings; apparently the process, in this case and the attention of the interested adult made the completed painting valuable.

It might be well to mention that the adult played a rather interesting role in gathering our pictures and drawings for analysis. It became apparent quite early that the adult listener was essentially a listener. The child used the adult as a sounding board and probably needed the adult for this rather than another child because another child would not make a good listener. However, the adult's interjection of new thoughts, or alternate ways of painting, or additional scenes that could be incorporated was very quickly turned off by the child. The most successful role of the adult seemed to be that of the interested but passive listener who could occasionally grunt or say, "Oh, my," "Oh, really," "Oh, yes, I see."

A good example of all of this is one recording of a taped conversation in which David, in the four-year-old group, started drawing with a felt pen and announced frankly, "I'm not sure what I'm going to draw. I'm not sure what this is." Once the shape seemed to look like a rectangle he announced, "This is a ship." He continued to make lines on the paper and announced that the ship had bags of peanuts in it. Another line which moved all over the page developed into a foodbelt which brought the peanuts, "Like it does in the cafeteria." Then, apparently out of nowhere, came the comment, "This is the ocean." And then going back to the original round motion for peanuts he said, "This is the treasure," and the original rectangle had now become the bad guys' ship. His announcements were stated in the present tense. Once his ideas were established, the

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thing is something, not in the process of becoming that thing. There was never any explanation of why things had changed and when the adult asked about the line that had been the conveyer belt earlier, the child responded, "I told you, it's the ocean. Can't you see all the waves?" Essentially then, what distinguishes this kind of picture from an adult painting is that it does not capture a moment in time, but is more like a diagram that indicates a series of changes through time.

All children were not as verbal as David, but the presence of the adult and the interest that an adult had in the painting process increased considerably the length of time that a youngster would continue painting or drawing.

It should be pointed out that a good deal of the painting done at the easel seemed to be more manipulative in nature than representative of any scene or idea. In part, this may be because of the nature of the material, which takes a fair amount of concentration and control. But, also, the color and tactile quality of paint seems to be an enjoyable experience in itself whereas the felt pen was a simpler material to control and the linear quality of the pen seemed to lend itself more to representation of motion or movement than the mass covering achieved with brush and paint. The findings, then, on our first "observational" studies of nursery school children, indicated that the child does not draw toward a specified, preconceived, picture, that representation is largely non-visual, and that

much scribbling is simply the result of manipulative, rather than representative, movements, and the main role of the adult was that of a sounding board rather than a "teacher."

A descriptive study of some aspects of children's prerepresentational drawings was recently completed by Harlan H. Holladay in his doctoral thesis at Cornell. He kept track of the amount of pressure a child used with varying drawing tools. He found, as might be expected, that older children had a firm and steady pressure on a pencil regardless of its softness, whereas young children varied the pressure just in the process of drawing. In giving children a choice of black, grey, and white crayons, he found that those crayons giving greater contrast with the background were favored for all ages, and that the two- and three-year-old child is not particularly anxious to try crayons other than the one initially selected. In his sample of children from ages two to five, he was able to determine clear differences or stages which roughly paralleled age differences. One rather interesting observation was that the types of grip used by the children also followed a developmental pattern, and most children by the age of four had arrived at a normal adult grip.

Holladay's data indicates that at age two the scribbling child has little control over his drawings, has various grip approaches, spends under an average of one minute per drawing, and although he can sometimes make an acceptable copy of a line, he cannot copy a rectangle or

more complex figures. However, by the age of three, he can control the pressure he makes with his drawing tool, his grip becomes closer to the adult method of holding a pencil, he spends twice as long drawing as the two-year-old, and his drawings are much more massed and controlled. The three-year-old can copy a line, a circle, but cannot make a recognizable copy of a square or rectangle. By the age of four, the child is able to adjust his pressure according to the characteristics of the pencil, holds the drawing instrument like an adult, usually spends about two minutes on his drawings, usually balances his drawings and has good control over his lines as can be seen with the beginnings of representation. The four-year-old cannot only copy a line and circle but can usually copy a square or rectangle satisfactorily but does not refer to the model he is asked to copy. By the fifth year, the child readily adjusts to a variety of drawing instruments and is able to maintain the proper pressure. His grip is usually the normal adult grip and, again, he spends longer time per drawing, selecting crayons for specific parts, and usually has some meaning and representation to his drawings which he will verbalize. He can copy everything younger children can copy but still has troubles with copying diagonal lines.

Although Holladay's findings are not unusual, and are what any observant nursery school teacher might expect, it seems important to have some clear documentation of the descriptive elements of children's drawings. Since we sometimes get carried away with the free, uninhibited

manner in which young children draw and paint, I am a little afraid that the literature tends to treat this age as a real artistic height of creativity and uninhibited in expressing themselves as most nursery school children are. Holladay's work contrasts with this approach.

Certainly the literature is filled with the "wonderful paintings" of this age, and Rhoda Kellogg's recent book, The Psychology of Children's Art, is a nice collection of some. Controls are almost nonexistent in her study, however Rhoda Kellogg has developed a system by which she sees in children's drawings and paintings evolving forms that she feels parallel the development of art in primitive man. I must confess that one can read a lot into children's drawings and often the nursery school paintings do look like Rorschach ink blots. Such studies do not help in understanding the significance to children of those nonrepresentational drawings.

But let me get back to some of the things we have been trying at Cornell. We theorized that perhaps one of the problems a young child faces in representating his environment is that he must abstract from a three-dimensional object those characteristics which lend themselves to a two-dimensional representation. If this is logical, that is the process of portraying three-dimensional objects on a two-dimensional surface is a high level abstracting process, then the representation in a three-dimensional material, such as clay, should be much more accurate than the drawing of this same object. We were obviously influenced in our

thinking by some of Arnheim's writings. We thought this theory would be relatively simple to check.

One of the nursery schools close to Ithaca served as our experimental population. We simply gathered examples of the clay modeling and drawings by these children. Each child was motivated individually; half the children were asked to do the drawing first, and the other half were asked to model with clay first. The directions were quite simple: "I want you to make a picture of a man. You know what a man is. Your Daddy is a man. Make the very best picture that you can. Take your time and work very carefully. Be sure to make the whole man, not just the head." When the child was finished, he was asked to identify parts that were not clear and such questions as, "Tell me about your picture," or "What might that be?" were asked. Two days later the same conditions were repeated except that now each child who had drawn before was given a ball of clay and he was similarly motivated.

There were 17 children included in the study and the products of these children were examined. It was possible to give a numerical score to the drawings based on the Goodenough-Harris Draw-A-Man Scale, but the clay products were a little more difficult to score. However, the drawings as a whole did get higher scores.

As a check, three judges were asked to rate the pictures and clay models. The judges agreed at a surprising .01 level of confidence. Again,

the drawings were rated higher; no piece of claywork was judged higher than any drawing, although in some cases they rated equally high.

Therefore, it would seem that the three-dimensional model does not provide the opportunity for children to express their environment any more easily than the two-dimensional drawing surface.

I might mention that there were several things that came from the study beside the comparison of drawing and clay work. If there was no indication of a man in the drawing, there was no indication of a man in the clay work. Apparently, if a child cannot make a figure in a two-dimensional medium, he obviously cannot do so in clay either. Also, it was surprising to find that a number of children attempted to use the clay in a two-dimensional fashion. That is, some children rolled little snakes of clay and with these constructed a two-dimensional man on a flat surface rather than modeling a man in a usual three-dimensional way. The three-dimensional structures suffered a little when children placed one form on top of another, but, for the most part, one could still see the intent of the child. In either the drawing or the clay work, it became obvious that the child was really not constructing a visual representation of a man, and the child's thinking process did not seem to differ in either art form. One big advantage to the drawing procedure was that every line that the child put down remained until the drawing was completed. Working in clay, however, meant that parts would become distorted as the

shape itself was manipulated. Probably filming the process of working in clay would be a more satisfactory approach to the problem. However, we certainly have no indication that working in clay is a better indication of a child's representational abilities than is working on a two-dimensional surface.

I might add one little incident that happened. One child in working with clay got quite frustrated because the forms he had called legs did not want to stick to his body shape. This same child in making the drawing was also frustrated and complained that "It didn't look right," and asked for another sheet of paper. It became obvious to us that the material itself was not the key factor in children's representation.

During this past year we have been gathering some drawings of children's representations of objects. These objects are three-dimensional geometric forms with open ends, and holes in one or more sides, and range in size from nine to twelve inches high. We were working under the hypothesis that distortion in drawings may be the representation of an experience with an object rather than a drawing of the object itself. Each of the geometric forms was given to the child and he was able to manipulate these until he was satisfied. After this examination, the youngster was asked to draw these forms with a felt pen on white paper. The drawings ranged from a fair representation of the object to shapes that bore little relationship. However, what was of most interest to us was the middle range of

drawing. That is, those drawings that had only a vague relationship to the geometric form but were not scribbles. What we tended to find was that the children drew those parts of the form with which they had had contact and these parts were often drawn isolated rather than as a segment of the whole form. An open cylinder might have been portrayed as a couple of circular shapes with some nondescript lines, and a box-like form with a hole in one side might be drawn as couple of isolated rectangular shapes and a circular form. It seems that when the youngsters are not necessarily trying to portray a camera-like reproduction of the form they see, but rather are drawing a representation of the form in terms of their relationship to it.

It has become very apparent to us that the drawing experience is a complex one for children. Apparently they glean from their environment a range of experiences which they put down in a variety of ways with a variety of materials. In trying to reduce the number of variables to keep track of, we decided to try having a number of children do one particular activity, primarily to see differences in strategy. We decided to have a number of children draw a square, and we attempted to keep track of some of the strategies used in doing this relatively simple task. There has already been some work done in this area for us to use as a basepoint.

We gathered square copies from children of ages two through five. In trying to develop some kind of system for organizing these squares, we put a sample of these squares on a continuum and then tried to divide them into what seemed like logical order and relationship. This method made it possible for us to see six different groupings, although I am sure that these could be extended to ten or reduced to three or four. The lowest category, 1, was just a scribble or what appeared to be pretty much random markings. Category 2 consisted of some sort of enclosed form, either in a teardrop or egg shape, but usually not centered and with no distinct sides. Category 3 was not only an enclosed form but also had at least one distinct side. Category 4 consisted of those forms that seemed to make an attempt at four sides. However, the line quality was uncertain, the corners were often rounded or did not meet, there might be jags or breaks in the sides, and the square form often looked more like a rectangular shape. Now category 5 looked clearly like a square attempt. Not only were there four sides but at least two of them were reasonably parallel. Some of the angles could be rounded or the lines would overlap or not quite meet at the corners, often the angles would not be 90 degrees and there would often be some distortion in that the four sides would not be equal in length. Category 6 was obviously a square. Here there would not only be four sides but four good angles reasonably close to right angles and the opposite sides would be parallel or close to it.

Having decided on the logical way of categorizing the squares, we next looked at the ages of children in these various categories. In category 1 there were no five-year-olds and no four-year-olds. So, category 1 consisted only of three-year-olds. Apparently the square is very difficult for three-year-olds to make. Category 5 and 6 consisted mostly of five-year-olds. Categories 5 and 6, you remember, included only those shapes that could be construed as being squares. So, it looks as if five-year-olds can pretty much copy a square.

In the middle categories, which included a variety of forms, were most of the four-year-old children. There were some three-year-olds in these groupings and some five-year-olds, but relatively few. Apparently something goes on within the child at the age of four that makes it possible for him to copy a square. Some of the literature in the field shows that he still cannot do a triangle but I'm afraid that we have not faced that problem yet. It looks as if the problem of square copying is one that will keep us occupied for some time.

I don't mean to be facetious. This is a fundamental question. What happens at the age of four? Although we are playing around with a simple problem of square copying, it has some basic questions. Is the child at the age of three unaware of his environment, or is unable to retain any visual image, or has he been unable to develop a strategy for copying forms? This is obviously not a question of physical coordination

since the child at three can do many tasks which require rather sophisticated motion. But, at the age of five, the child is apparently able to do this simple task, or at least most children can. Is it possible to teach youngsters how to make a square before they are five? Some of our three-year-olds did very well at this task and obviously there must be some reason for this. Although no five-year-olds fell into our lowest category, some five-year-olds did not do well on this task and I can't help but wonder why?

In trying to make some sense out of these questions, we decided to see if we could help some youngsters in developing square making ability. We used the three-year-olds at the Cornell nursery school for our sample population. This particular activity went on in the spring and the children ranged in age from 42 to 49 months. They were just beginning to turn four years of age. The question was simple: Would the opportunity to imitate strokes, trace around square shapes, draw a square object, recognize squares in the environment, help these children to make better squares, or would this training have no influence upon their natural development? The children were pretested by asking them to copy a four inch square which was outlined on a piece of white cardboard. The children had an 8-1/2 by 11 piece of white paper, and were merely asked to copy the square as closely as they could. "Draw just what you see here." Since we suspected that a bit of interest in squares

from an adult might be the key, we decided to give progressively more and more training to fewer and fewer children.

The first group of nursery school children were given the square to examine and feel around and asked again to copy it. The next activity was for ten children only. These ten were shown how to draw a square by my assistant and each child individually was asked to imitate the same sequence of strokes. This was repeated until each child could repeat the task satisfactorily. The eight children were shown windows in the nursery school area, windows in picture books which were made of squares, pointing out the four straight sides and angles, and each child ran his finger around the window form, and then in turn was asked to draw a window. It was pointed out that, "Look!" he had made a square and again each child was helped to complete the task. Then six of these children were given more intensive training with a variety of exercises including tracing around squares with their fingers, constructing squares out of paper strips and later with sandpaper and colored felt, drawing a square by tracing around a variety of square forms, cutting out predrawn squares, identifying square objects, and so on and so on.

It was about one month from the pretest to the completion of the experiment and at that time the post-test was given to all the children in the nursery school. Again the task was simply to copy a square. All

the squares, both the pretest and post-test ones, were thrown together and four judges put them into our categories with an interrater reliability of .95. The results showed that the variety and degree of training seemed to have no effect on the resulting square making of these children. Although the children did improve somewhat over the period of time that elapsed, some of the youngsters went up in rank and some went down; it was only the mean that showed any improvement.

When the same youngsters returned as four-year-olds in the fall, we gave another post-test. This was now five months later and we found that there indeed had been an amazing improvement. Again, however, there seemed to be no logical improvement and some children skipped from category 2 to category 5 whereas some children actually went the other direction. But the mean scores had improved and now no four-year-old ended up in the lowest category.

It is quite clear, I think, that no real inferences can be drawn from a small sample of nursery school children. But it became quite apparent that the kind of training we were doing was not of value to all the children. It is not clear that it was of no value to all children. It may be that we were exercising the wrong kinds of things in our experiment. Possibly the actual physical manipulation of the forms was not a key factor, and the concern for copying and tracing may be irrelevant to

the whole problem. Certainly these children could identify a square in a series of geometric forms. But there are some interesting things that evolved from this little experiment which I must mention.

One of the things we did was to ask the children one-half hour after they had copied a square to identify what they had drawn. If it was close to looking like a square, that is in category 5 or 6, the child would label it as such. But only one child, one-half hour after the drawing, actually labeled the drawing as a square when it did not look like one to the observer. Apparently whatever mechanisms the child employed in copying the square were not utilized in identifying cues in the copy itself. This is close to what Eleanor Maccoby found when she asked nursery school children to play post office by mailing shapes into the proper mail slots. If a form looks like a square it will be placed into the proper slot by a child, but if it doesn't look like a square, then it won't, whether the child made the copy or not.

It was surprising to find that apparently children do not develop in a logical order from random marks up the scale to a good looking square. This jumping around from one category to another may be an indication that the child is trying different methods or different strategies in copying a square at different times. Possibly he is paying attention to different parts of the square itself in the copying process or maybe he is

organizing his relationship to the details, but whatever he is doing, he certainly does not do it consistently.

One interesting factor in all this, is that most children do not look back at the model once they have started to draw. For the most part they draw a continuous line, although some children that drew squares that fell in the upper categories did stop and start again at each corner. There seemed to be no consistency in where these children started or in the direction in which they went. However, those in the upper two categories, the better square makers, would start at one corner and either go up or down, not horizontally.

If the square copy was in a D-shape, that is with one straight line, the straight line would be made first. The rest of the form seemed to be less well defined, as though the child remembered only that it was a closed shape.

Trying to develop some kind of a large theoretical framework for all of these small but interesting bits of information is a somewhat formidable task. However, I have tried to make some sense out of this and some of these theories I'll be testing in the coming year or so. I certainly never expected to get involved in a simple task like square making when I started to look at children's drawings. But it may be that this task can provide some clues for the larger picture. At any rate, here are some of my thoughts.

Possibly the learning process which is a part of being able to copy a square is the same process which the child uses in organizing and dealing with the rest of his environment. It became obvious to us that the methods of teaching how to copy a square were based upon certain assumptions on our part and not based upon what the child himself does. The concern for a visual likeness to a square has made us assume that there is a straight line progression from a scribble to a visual approximation of a square. Maybe this is not a progression in visual terms at all, but a progression through a series of methods of adapting to and learning from the environment.

Most children at the age of five are drawing pictures which have a content that adults can recognize. Most three-year-olds do not, their drawings are scribbles. As you can see, this merely parallels the results of our square copying experiment. If we can develop a means to teach children how to copy squares, I expect we will also have had an effect on their learning process. We plan to keep track of their drawing development and the relationship between this and the square copying ability.

Most nursery school teachers know several important dictums about art activities. One of these is "Never ask a child 'what is it'?" Another is to be sure that there is a large range of art materials available, including not only paints and crayons, but glue and colored macaroni, pipe

cleaners and styrofoam balls, colored soap suds and shiny paper. In our experiments it seems that the more interaction between adult and child in the drawing process, the longer the child was involved in the drawing itself. Maybe asking "What is it" in a non-threatening fashion is the most important thing a nursery school teacher can say. I expect that a large range of materials to doodle in can be diversionary and actually stand in the way of a purposeful pursuit of a solution to a problem of expression. Maybe the value in any art material is the opportunity it provides the child to develop strategies to conceptualize and express the relationship the child has developed with his environment. The mastery of a few materials may be much more important in this process than the messing around with a whole range of projects.

One of the experiments which I would like to see underway this fall is the actual halting of the child in the drawing process. For example, when a four-year-old child starts to copy a square he may draw one straight side. Usually this is followed by a rounded line to complete the form, which will look something like a capital D. If the child is stopped after the completion of the straight line and is told to look again at the model, I expect he may resume drawing with another straight line. Maybe what we should be doing in preschool programs is to look at objects with children, or point out differences in texture, or show an interest in the stones he brings to school, or in the worm he has found in

the nursery school yard. Maybe it is this relationship between the child and his environment which should be stressed and not the concern for the making of objects or the completion of projects.

One of the areas we will be focussing on this fall is a closer look at the process the child goes through when he attempts to copy a square. This should be done on a longitudinal basis and I expect that two or three children could be asked to copy a square every week. They may get pretty tired of this as an activity, but a record of these attempts over a year's time would be very helpful. I expect that there will be no consistent improvement in terms of following our square categories, but there may be some consistencies in terms of how the youngsters themselves solve this task.

The nursery school is rapidly assuming the status of one of the most important segments of our educational system. There is a structure to its organization. My concern is that children need to have some say in how that structure is formed. Art has a potentially important place in the curriculum, but I expect we are going to have to be careful that art activities are not reduced to the level of manipulative, busy work, or to the worse alternative of cute nursery school projects. Art is one area of learning that children engage in naturally and I expect that I want to give that natural eagerness some scientific justification.